The Pterotinae (Coleoptera: Lampyridae)

Frank A. McDermott, Wilmington, Delaware

In my Taxonomy of the Lampyridae (1964) the subfamily Pterotinae is composed of two genera, *Pterotus* LeConte and *Harmatelia* Walker, which are widely separated geographically. Through the courtesy of Mr. J. W. Green, California Academy of Sciences, and Miss C. M. F. von Hayek, British Museum (Natural History), I have been able to make a comparative study of *Pterotus obscuripennis* LeC. and *Harmatelia bilinea* Walk. While *Pterotus* is considerably larger than *Harmatelia* the two species are similar in several characters. In both the pronotum is strongly convex with but little lateral margins; in both the head is only partially covered by the pronotum, most of the eyes being visible from above; both have a small nick or indentation of the edge of the pronotum just forward of the posterior angles, and the anterior angles are obliterated. The antennae have eleven articles, each article from 3 to 10 bearing a ramus; the large antennal sockets are forward of the eyes and not contiguous; there is at least an obsolete suture between the clypeus and the front. The trochanters are attached obliquely to the femora; the inner edges of the metepisterna are not sinute; the abdominal spiracles are dorsal. The mandibles are rather stout and not suddenly slender in the distal half i.e., not modified in the sense of Green, 1959, p. 89. The general trend of this combination of characters is to place both species in the Lampyridae. Unfortunately they agree in another point—the females of neither have been described and apparently not collected or identified.

However, *Pterotus* and *Harmatelia* differ in a number of characters. In the former the intermediate coxae are not contiguous but are somewhat separated by a sharp ridge between them; in *Harmatelia* they are contiguous. The antennal rami are attached to the articles by a broad base in *Pterotus* but narrowly at the distal ends of the articles in *Harmatelia;* in the maxillary palpi of *Pterotus* the terminal article is scarcely

thicker than the preceding ones while in *Harmatelia* the terminal is conoidal as usual in lampyrids. The labial palpi of both species have a simple, rounded terminal article, not crescentic or securiform. The scutelli are quite different. Perhaps the most pronounced difference is in the aedeagi, that of *Pterotus* (Fig. 1) being of the general form usual in Lampyridae while that of *Harmatelia* (Fig. 2) is markedly different.*

The antennal rami of both species are long, narrowly remiform, diffuse, not fan-folding. No distinct joint structure at the bases of the rami, like that between the articles, is present in *Harmatelia* but the narrow base apparently serves as a flexible hinge, allowing at least limited voluntary independent movement; in spite of the rigid base, voluntary and indepndent bending and relaxation of the rami would not be excluded in *Pterotus*.

The abdominal spiracles are in the pleural fold in *Pterotus*, but *Harmatelia* does not appear to have such a fold and the spiracles are dorsal, near the lateral edges of the segments.

Thus it appears that while in *Pterotus* and *Harmatelia* we have two quite different insects, they bear a considerable degree of similarity in some characters. Neither fits quite strictly to the accepted lampyrid characteristics and both have some suggestion of phengodid affinities. Combining them in the subfamily Pterotinae is admittedly arbitrary but nevertheless serves to bring them together as transitional forms.

There remains the question of luminosity. So far as I have been able to ascertain luminosity has not been observed or at least reported in *Pterotus*, and Dr. J. Gordon Edwards tells me that the adult males he has taken are nonluminous. LeConte (1859) said "None of the ventral segments are phosporescent" but this may mean only that large luminous organs as in, e.g., *Photinus*, are not present. E. E. Green (1912) has illustrated

* It may be noted here that the aedeagus of *Phengodes* (? *laticollis*) is of the lampyrid pattern; 2.0 mm long, with a fine tube 9.0 mm long projecting from the median lobe. The aedeagus of *Mastinocerus texanus* LeC. is similar, the lateral lobes more slender. Neither of these species shows obvious indications of abdominal luminous organs, but that on the prosternum of *Mastinocerus* is clearly visible.

the distribution of the minute luminous spots in *Harmatelia;* these are primarily dorsal and are closely associated with the spiracles, but the light is visible from below. Examination of the ventral segments of *Harmatelia* shows low intumescences at the points shown as luminous by Green, sometimes with a dark central spot which in some cases appears to be the open end of a tube 0.025 mm or less in diameter (probably an artifact). These spots are surrounded by a granular mass suggestive of the cell masses at the luminous points on *Phengodes* ♀ (Buck 1938, p. 400). Because of the shrinkage in drying the abdomen of *Harmatelia* is nearly flat and the cell masses may be actually just under the dorsal surface. They do not appear to be the "pores" at the points of muscle attachment (LeConte 1881, p. 33; McDermott and Crane 1911, p. 308 and 310); the points of muscle attachment were not distinguished in either *Pterotus* or *Harmatelia.*

Structures similar to those in *Harmatelia* and in approximately the same location and with similar subchitinous granular masses were present in *Pterotus* but in the absence of reported luminosity their function is doubtful. It is possible that both *Pterotus* ♂ and *Harmatelia* ♂, like *Lucidota atra* and *Phengodes* ♂* have the ability to produce light only briefly after eclosion and this would be missed except under unusual circumstances and in darkness. Neither species shows any trace of the residual larval luminous organs on the 8th ventral segment as usually found in even non-luminous lampyrids. Sectioning of freshly killed and preserved specimens would be necessary to establish the structure, and observations on freshly emerged *Pterotus* ♂ in the dark are highly desirable, as well as the identification of the female.

Descriptions of *Pterotus obscuripennis* have been given by LeConte (1859; 1881) and by Fender (1962). LeConte (1859) thought it might be a drilid but later (1881) placed it in the

* Verbal information from the late H. S. Barber, which has been confirmed by Dr. James E. Lloyd. I have not been able to find that Barber published his observation.

tribe Pterotini of the Phengodini; Fender puts it in the subfamily Amydetinae. Crowson (1955, p. 68) says that it would trace more easily to the Lampyridae than to the Phengodidae by his key, and on p. 171 he lists it among the Lampyridae.

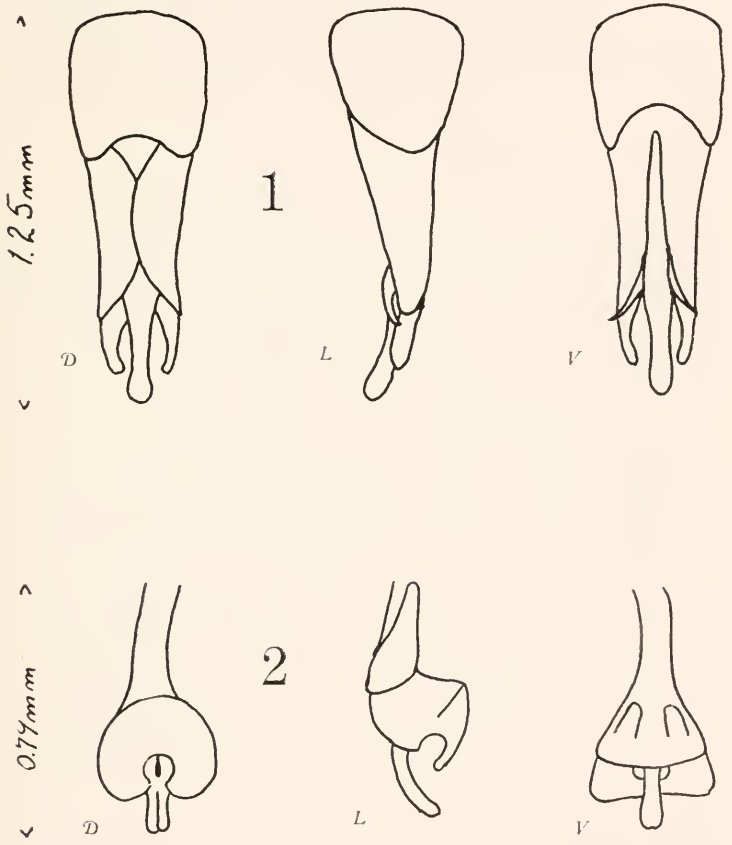

Fig. 1. Aedeagus of *Pterotus obscuripennis* LeConte. The general color is yellow, except the curving tips of the lateral lobes which are white, and the two sharp curved projections which are brown.

Fig. 2. Aedeagus of *Harmatelia bilinea* Walker. Entirely yellow except for the white tip of the median lobe.

In both figures: *V* is the ventral view, *L* is the lateral view, *D* is the dorsal view.

No complete description of *Harmatelia bilinea* appears to have been published; Walker's original description (1858) is very brief. I am therefore appending a description based on three specimens from the British Museum. Bourgeois (1909) described his *Haplogeusis distincta* and *H. ceylanica,* which E. E. Green (1911) synonymized with *Harmatelia,* calling attention to differences between Walker's species *bilinea* and *discalis* and between specimens found at different localities in Ceylon.

Harmatelia bilinea Walker

Description of *Harmatelia bilinea* Walker based on three specimens from the British Museum (Natural History). These were very similar, 6.0–6.2 mm long by 2.0 mm broad; the length of the antennae varied, being 6.1, 6.65, and 5.85 mm long in the three specimens. Other dimensions given below are for a dissected specimen.

Type locality, CEYLON.

Pronotum 1.15 mm long by 1.71 mm broad, widest at posterior angles. Very convex with no flat lateral or anterior borders; lateral and fore edges slightly reflexed; base straight, edge thickened. Anterior angles obliterated; posterior angles slightly less than 90°, a little salient laterally due to an indentation in the edge of the pronotum just forward of them. Color mostly dark brown, lighter medially forward; thickened basal edge and areas around angles yellow. Finely granulose; median narrow channel. Villosity pale, appressed, fairly long at sides.

Scutellum triangular, not trapezoidal; broad, medially carinate in basal half, apex truncate; dark yellow, hairy. Mesonotal plates broad, dull yellow.

Head: Frons and mouth parts project forward, giving the effect of a short beak. The pronotum is bent downward and forward with reference to the axis of the body, resulting in the head being directed obliquely downward; this is also true in *Pterotus,* but due to contraction in drying, the position may not be that of the living insects. Frons dark brown between an-

tennal sockets; vertex nearly black, slightly concave medially. Antennal sockets large, yellow, in front of eyes, and not contiguous. Clypeus short, yellow, with a few stiff setae; a rather pronounced sulcus between it and the frons. Mandibles small, semicircular, tapering uniformly to tips. Maxillary palpi short, with the terminal article of the usual thickened conoidal form. Labial palpi short, terminal article simple, rounded, not crescentic. Frons 1.28 mm across eyes, 0.9 mm between them; eyes small and distant but protuberant.

Antennae of 11 articles, the second very short; 3 to 10 each with a narrowly remiform ramus 3 × or more as long as the article, attached at the distal end of the inner edge; 11 like the ramus on 10. Rami diffuse, not "fan-folding," bending at various angles from a "hinge" at the basal end. Color generally dark reddish brown to practically black.

Elytra 5.1 mm long by 0.77 mm broad as seen from above; subparallel, widest at base, narrowing somewhat posteriorly; deflexed over sides of body. Ground color dark brown, with a pale yellow oblique vitta, wide at base and attaining suture at midlength, continuing to apices; a narrow yellow border on external edge near apex.* Rugose, with a fine granulation between the coarser sculpture. Villosity pale, oblique; darker on brown portions; no secondary villosity observed. Only basal traces of epipleura, the edges of the elytra being slightly inflexed; two obsolescent costae on each elytron. Wings iridescent.

Thoracic sterna and ventral abdominal segments yellow; tergites reddish brown with yellow lateral borders. Inner edge of metepisternum slightly curved, but not sinuate; almost straight in another specimen. Posterior edges of ventral segments straight; 7th narrower than 6th; 8th very small, embracing the broadly ogival 9th.

Abdominal spiracles on the dorsal side of the segments near lateral edges; no distinct pleural fold.

Supposed luminous spots visible on ventral surface of abdomi-

* If the yellow is considered the ground color, Walker's description is equally applicable: ". . . elytris nigro bivittatis."

nal segments at the locations illustrated by E. E. Green (1912), as low intumescences with a dense granular appearance below the transparent chitin, and sometimes with a small central black spot. A similar structure is visible forward of the intermediate coxae, as shown by Green. No evidence of the residual larval luminous organs on the 8th ventral segment.

Legs rather long; mostly yellow. Trochanters attached obliquely to the femora; intermediate coxae in contact or very closely approximate. 4th tarval article very small, bearing a small bilobed velvety pad.

Aedeagus: see Fig. 2.

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